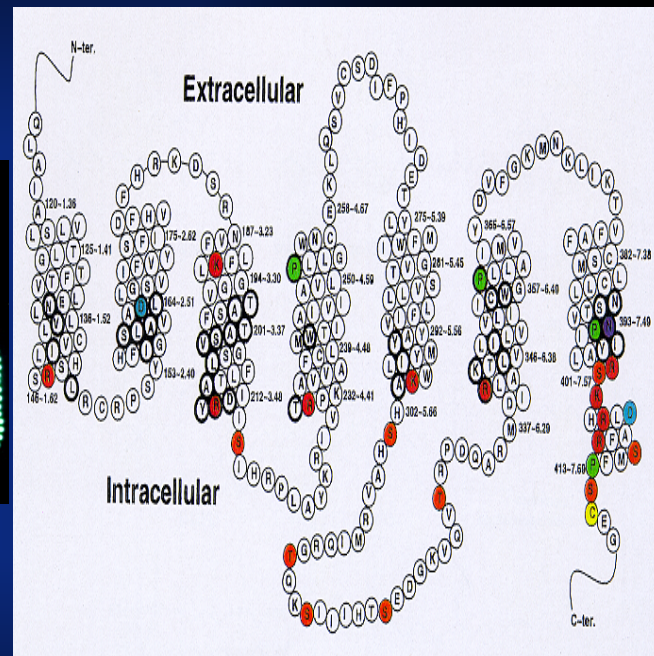
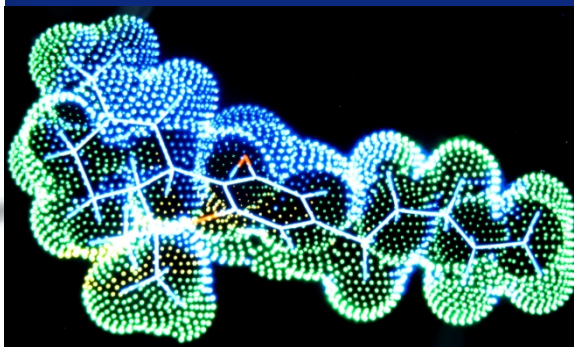


Endocannabinoid System Cannabinoid Drugs

STCM Conference Bern 22.1.2013



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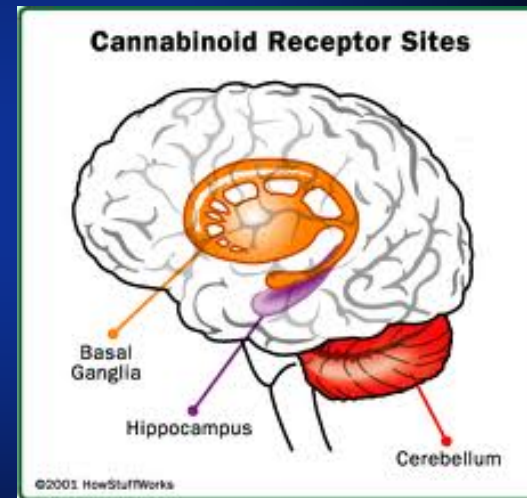
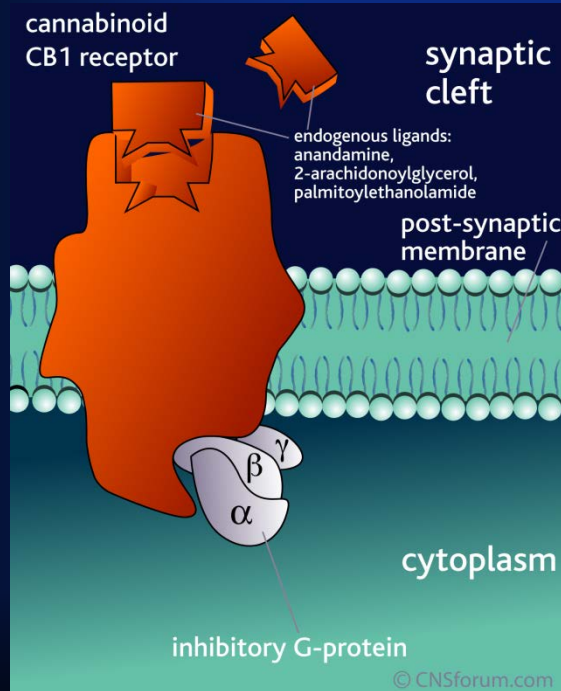


Endocannabinoid System

Milestones

1988: First cannabinoid receptor (rat brain) → CB₁-R

[Devane et al, Mol Pharmacol 1988]



All mammals, but also leeches, birds, amphibians, fishs, see urchins, mussels, etc.; but not insects.

Endocannabinoid System

Milestones

1992: First CB₁-R ligand (pork brain):
→ arachidonylethanolamide, „anandamide“, AEA
[Devane et al, Science 1992]

1993: Second cannabinoid receptor (rat spleen)
→ CB₂-R
[Munro et al, Nature 1993]

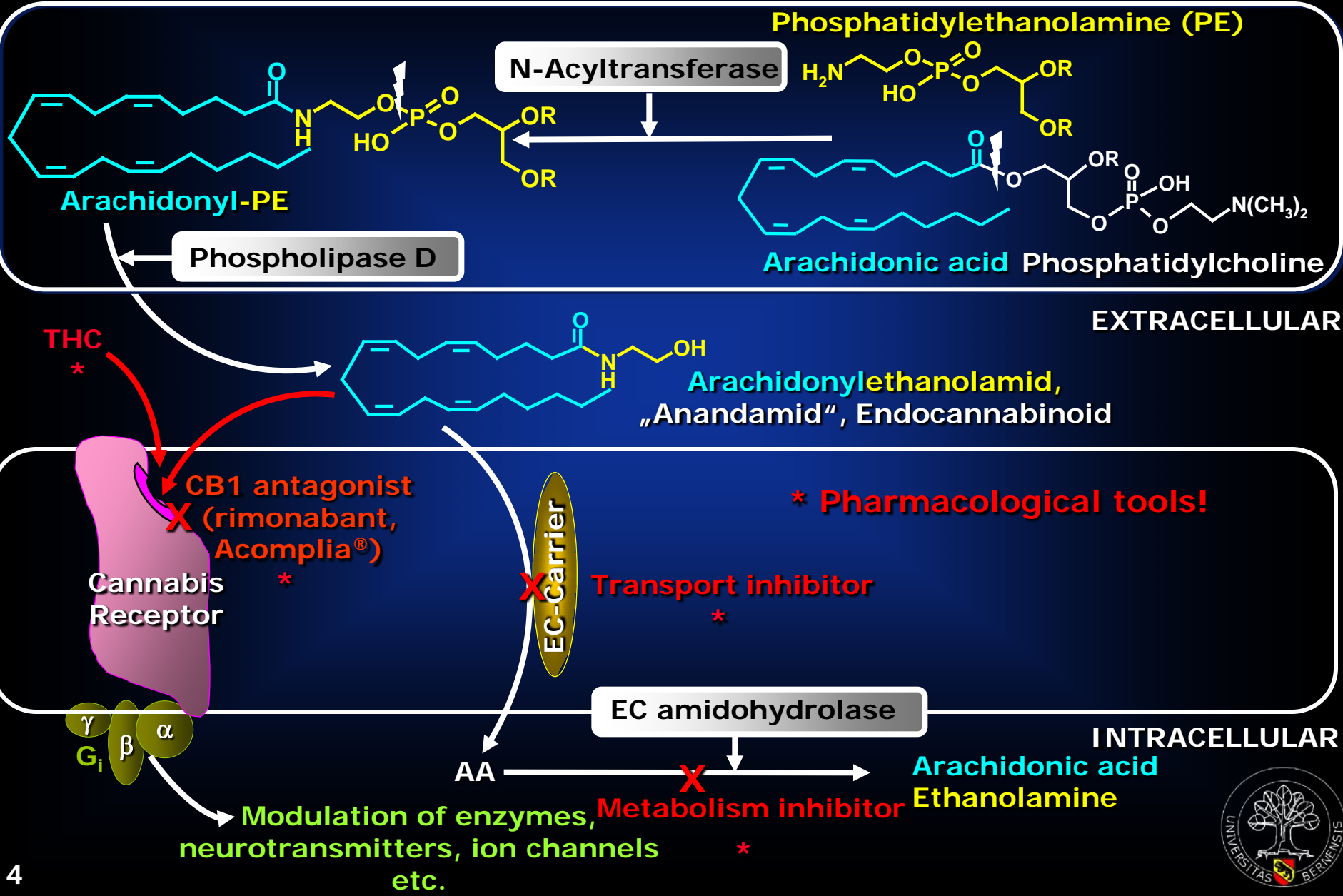
1994: First synthetic CB₁-R antagonist (SR 141716A, rimonabant, Acomplia®; Sanofi)
[Rinaldi-Carmona et al, FEBS Lett 1994]

1997: Second CB₁-/CB₂-R ligand:
arachidonylglycerol, 2-AG
[Stella et al, Nature 1997]

20?? CB₃-R?

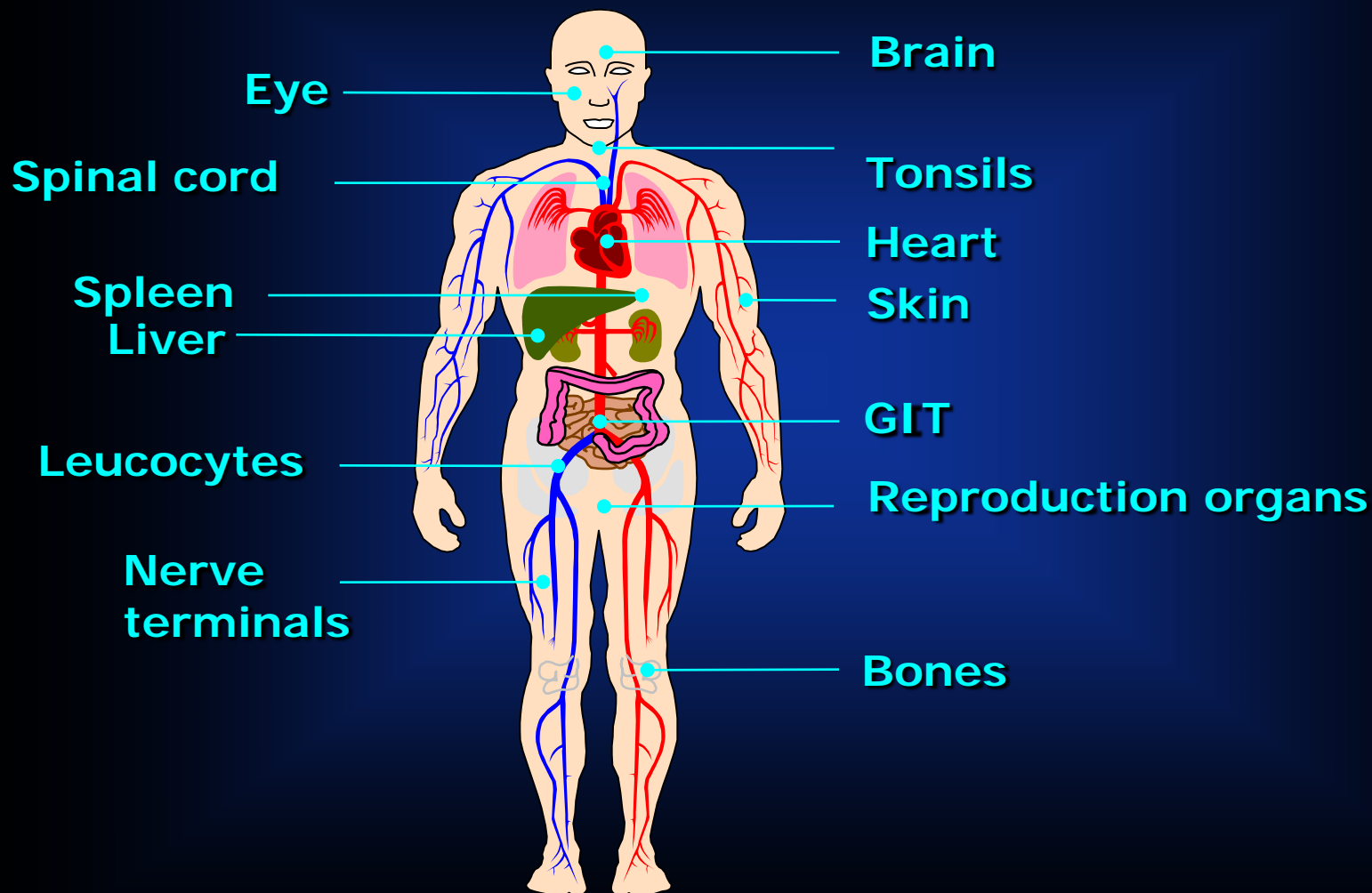


Endocannabinoid System



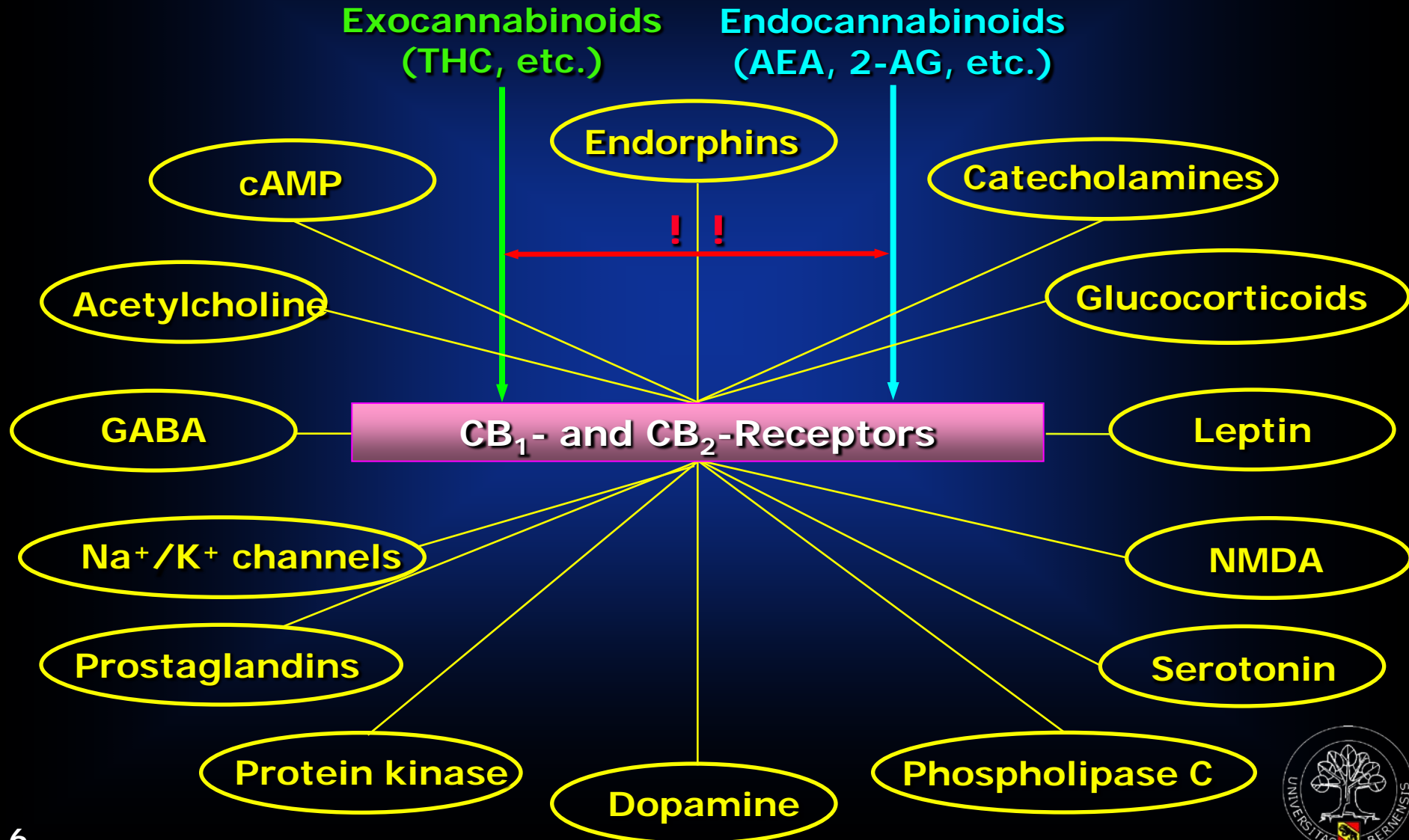
Endocannabinoid System

Physiological keyplayer



Endocannabinoid System

Physiological keyplayer



Endocannabinoid System

Directly or indirectly involved in:

- ➔ Effects of THC
- ➔ Processing of negative memories, traumas, stress
- ➔ Mental diseases, psychiatric disorders (schizophrenia, depression)
- ➔ Drug abuse
- ➔ Modulation of anxiety
- ➔ Sleep control
- ➔ Perception of pain
- ➔ Control of movement
- ➔ Control of food intake, appetite
- ➔ ...

Endocannabinoid System

Vincenzo di Marzo, Napoli ECS Research Institute:

“The endocannabinoid system is essential to life and it relates messages that affect how we relax, eat, sleep, forget and protect”

Cannabinoid Drugs and Application Forms

Nature and/or lab ?

Phytocannabinoids



Synthetic Cannabinoids



Multi-component preparations
(Cannabis extracts etc.)
„Shotguns“

Mono-component preparations
(dronabinol capsules etc.)
„Silver Bullets“

Modulation of Endocannabinoids and EC receptors

Pharmacological effects

Cannabinoid Drugs and Application Forms

Folk medicine, self-treatment:

- ➔ **Cannabis-based medicines:**
Joint, tea, „Sativa-Oil“, „Simpson Oil etc.
Street Cannabis, home made.
Quality and dosage not controlled.
Harmful or inefficient application modes.



Evidence-based medicine:

- ➔ **Cannabinoid-based medicines**
THC (dronabinol, Marinol®),
nabilone (Cesamet®), CBD.
- ➔ **Cannabis-based medicines**
Standardized extracts (Sativex® , nabiximols)
and buds (Bedrobinol®).
Established galenic formulations,
„formula magistralis“ preparations.
Quality and dosage controlled.
Less harmful and more efficient application forms.



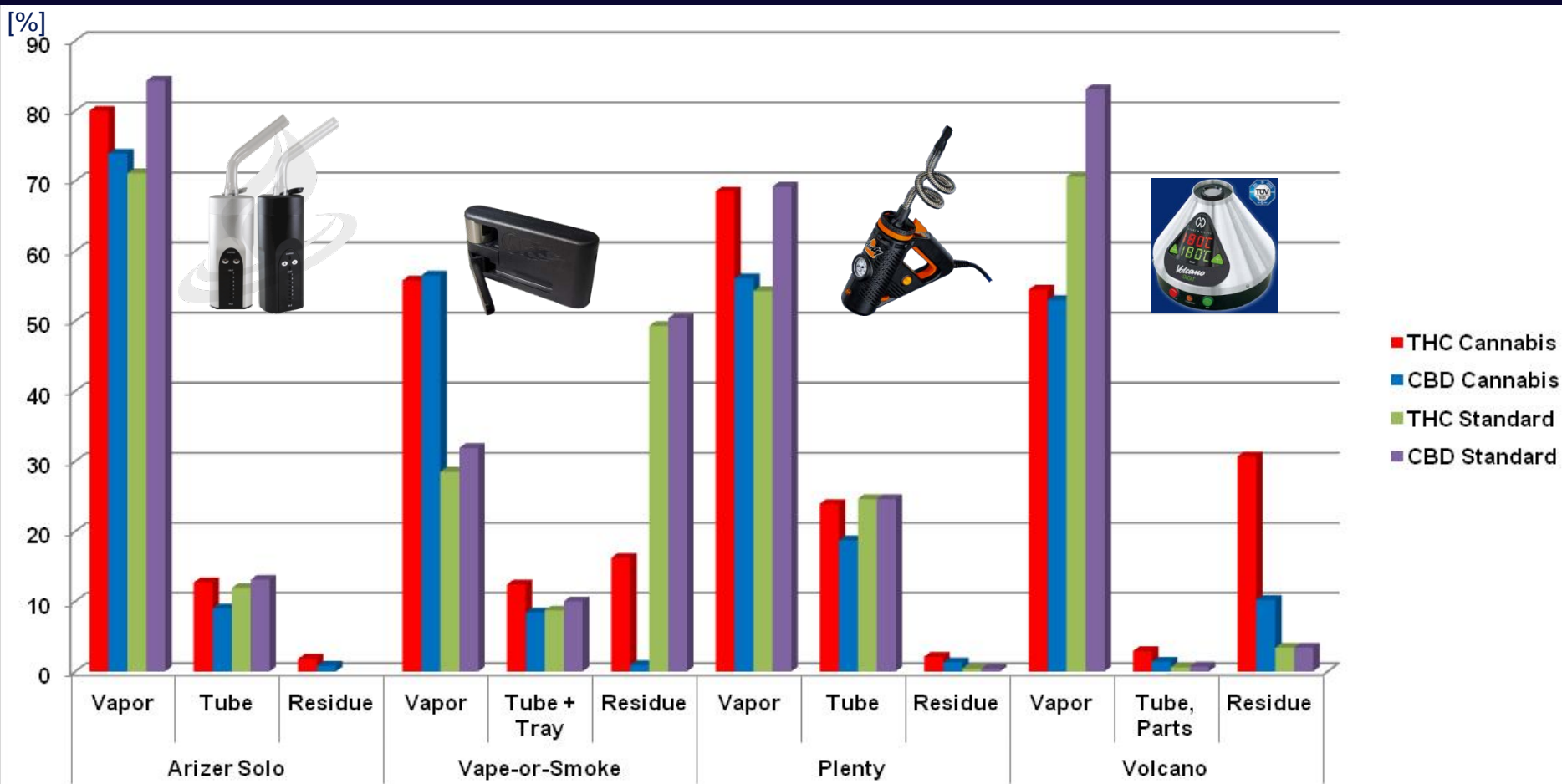
Cannabinoid Drugs and Application Forms

Galenic formulation	Bioavailability	Effect
Cannabis cigarette (smoke)	15-25 %	rapid
Cannabis inhalation aerosol (vapor)	50-90	rapid
Cannabis sublingual spray	>90	slow
Cannabis capsule	?	slow
Cannabis tea	low	slow
Cannabis oil	?	slow
THC capsule	5-20	slow
THC drops	5-20	slow
THC suppository	20-40	rel. rapid
THC patch	?	?
THC injection solution	100	very rapid



Cannabinoid Drugs and Application Forms

Pocket-size vaporizer devices In vitro validation



[Lanz C, DKF 2013, unpublished]



Cannabinoid Drugs and Application Forms

Options and Visions

Folk medicine, self-treatment without prescription:

- ➡ Access to Medicinal Cannabis with quality certificate
- ➡ Preferably using validated home recipes and harmless application forms (vaporizer)
- ➡ No criminalization of patient, even if not (yet) compatible with law.

Academic medicine, controlled treatment with prescription:

- ➡ Swissmedic approved drugs (TBMs and CBMs)
- ➡ Medicinal Cannabis from licensed producers and suppliers, i.e. public pharmacies
- ➡ Pharmacopoeia monographs
- ➡ Optimized, patient-individualized formulations, „formula magistralis“, respecting GMP.

